

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
25 August 2005 (25.08.2005)

PCT

(10) International Publication Number  
**WO 2005/078743 A1**

(51) International Patent Classification<sup>7</sup>: **H01B 3/30**,  
C08G 77/04

(21) International Application Number:  
PCT/KR2004/003287

(22) International Filing Date:  
14 December 2004 (14.12.2004)

(25) Filing Language: Korean

(26) Publication Language: English

(30) Priority Data:  
10-2004-0010827  
18 February 2004 (18.02.2004) KR

(71) Applicant (for all designated States except US): **SO-GANG UNIVERSITY CORPORATION** [KR/KR]; 1  
Sinsu-dong, Mapo-gu, Seoul 121-742 (KR).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **RHEE, Hee-Woo**

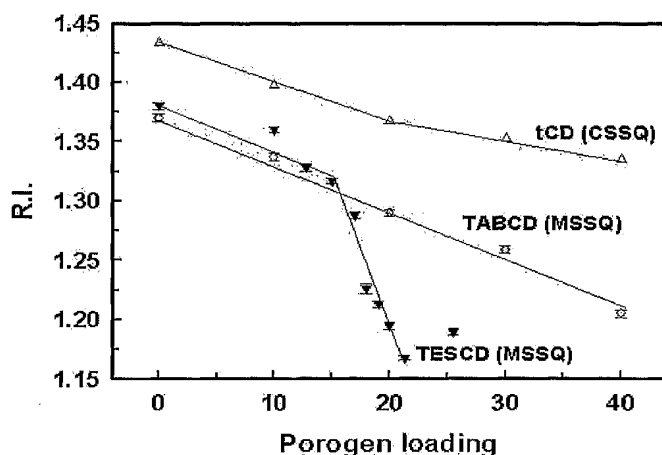
[KR/KR]; 61-502 Banpo Apt., Banpobon-dong, Seocho-gu, Seoul 137-040 (KR). **YOON, Do Young** [KR/KR]; 936-208 Faculty House, Bongcheon 7-dong, Gwanak-gu, Seoul 151-057 (KR). **CHAR, Kook Heon** [KR/KR]; A-304 Banpo Hyundai Villa, 104-6 Banpo 4-dong Seocho-gu, Seoul 137-806 (KR). **LEE, Jin-Kyu** [KR/KR]; 143-902 Gwanak Dream Town, Bongcheon 5-dong Gwanak-gu, Seoul 151-770 (KR). **MOON, Bongjin** [KR/KR]; 704-1408 Sinwoo Apt., Muwon Maeul, Haengsin-dong Deogyang-gu, Goyang-si, Kyungki-do 412-220 (KR). **MIN, Sung-Kyu** [KR/KR]; 303 Geumtap Villa, 549-1 Gwangjang-dong -Gwangjin-gu, Seoul 143-210 (KR). **PARK, Se Jung** [KR/KR]; 1618-9 Bongcheon 7-dong, Gwanak-gu, Seoul 151-057 (KR). **SHIN, Jae-Jin** [KR/KR]; 722 Yuksa Apt., Gongneung 2-dong, Nowon-gu, Seoul 139-772 (KR).

(74) Agent: **PAIK, Nam-Hoon**; 14th Fl., KTB Network Bldg., 826-14, Yeoksam-dong Kangnam-ku, Seoul 135-769 (KR).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,

[Continued on next page]

(54) Title: CYCLODEXTRIN DERIVATIVES AS PORE-FORMING TEMPLATES, AND LOW DIELECTRIC MATERIALS PREPARED BY USING THE SAME



(57) Abstract: This invention is related to a reactive nanoparticulate cyclodextrin derivative useful as a porogen and a low dielectric matrix, with excellent mechanical properties and uniformly distributed nanopores, manufactured by sol-gel reaction of the above reactive cyclodextrin. Furthermore, this invention also is related to an ultralow dielectric film, with uniformly distributed nanopores, a relatively high porosity of 51%, and a relatively low dielectric constant of 1.6, manufactured by thin-filming of the conventional organic or inorganic silicate precursor by using the above reactive cyclodextrin as a porogen.



GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**(84) Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,

**Published:**

— with international search report

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*